

HOW TO... Resize and crop photos

Most digital photos require some size tweaks before printing. Adam Banks explains how to resample an image and apply crops so your prints look their best

It's easy to take photos with today's digital cameras, but printing them isn't so straightforward. When you use an online or in-store photo printing service, you may find your photos are the wrong shape because, although there are long-established sizes for photographic prints, there is no standard proportion (aspect ratio). The 6x4in format, as used in most photo albums, represents an aspect ratio of 1.5:1. The next size up, 7x5in, is slightly squarer at 1.4:1 and this trend of increasing squareness continues through the 8x6in (1.33:1) and 10x8in (1.25:1) options.

Most digital SLR cameras shoot images with a 3:2 (1.5:1) ratio, similar to 35mm film, while compact models usually produce 4:3 (1.33:1) images, just like the picture displayed by a traditional monitor. A few models even shoot at 16:9 (1.78:1), as used by widescreen displays. Some digital print services now offer 4:3 and 16:9 formats, but the most plentiful options are still the traditional ones. Even when printing on your own inkjet, you may want to use pre-cut photo paper, or you may need to match the dimensions of photo albums and frames.

There are three ways to print a photo in a format that doesn't match its original aspect ratio. First, you can force-fit it by squashing or stretching the image to fill the space, but this will look dreadful. Second, you can print the whole photo with white strips at the top and bottom or sides. Although this is a perfectly

reasonable option, most people aren't keen on it. Third, you can crop the photo to fit the paper size, removing the parts at the top and bottom, or sides, that won't fit.

Print services should give you a choice between these last two options, and many let you set your own crop area. You're shown a preview of each photo with a box superimposed on it, and you can move this box around to ensure you don't chop off essential details.

TOP OF THE CROPS

It's more flexible and often faster to do your own cropping in your image-editing software. It also allows you to resize photos before you upload them to a web-based print service. It isn't essential, because the print service will output images at the size you've chosen. However, there are two good reasons to resize or 'resample' an image to match the output dimensions. First, you can reduce the file size. It's pointless uploading a huge 12-megapixel image in order for it to be turned into a modest 6x4in print, and online services may not even accept files that large. Second, you can maintain sharpness. When you print a very high-resolution image at a small size it may not look crisp, simply because the amount of detail is reduced. The solution to this is to sharpen the image while resampling it to a smaller size.

Here we show all these processes in action. We've used Adobe Photoshop Elements 5, but

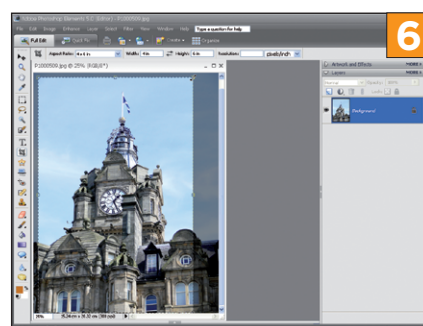
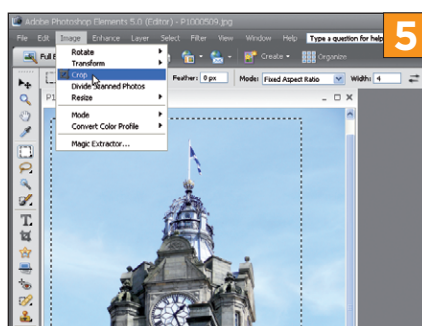
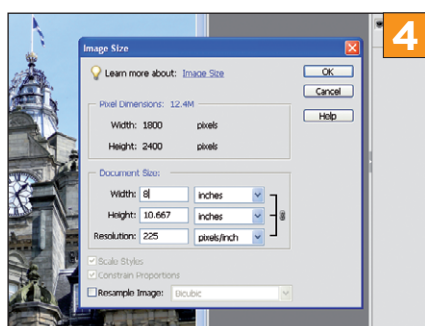
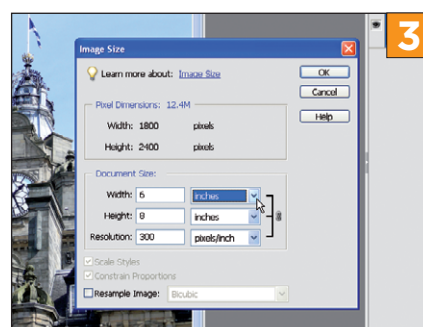
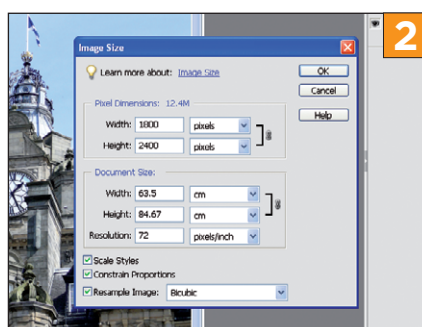
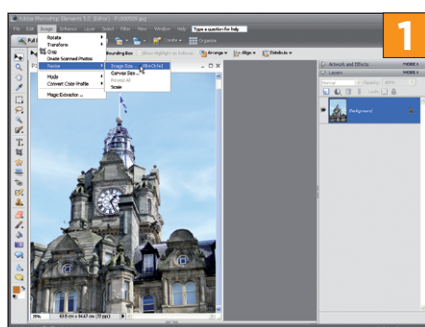
any good image editor will provide similar functions to those applied here.

1 First, check your image's pixel dimensions. This tells you how large you can print it at good quality. In Photoshop Elements, go to Image, Resize, Image Size.

2 This dialog box, which is roughly similar in all image editors, correlates the number of pixels in the image with a nominal resolution and output size. Under Pixel Dimensions, you can see how many pixels the image contains. The number followed by 'M' shows how many megabytes of data this amounts to – don't confuse this with megapixels (millions of pixels). Below this is Document Size, indicating the physical size the image would be when printed at a given resolution (the default is '72 pixels/inch').

3 The appropriate resolution to use when printing is 300 pixels/inch. First, untick Resample Image, so any changes affect the calculations, not the image itself. Type 300 into the Resolution box: the width and height will update accordingly. Use the drop-down menus to change the units from centimetres to inches. This image works out at 8x6in.

4 To change print size, enter the width or height. Setting the width to 8in, our pic's height works out at 10.667in. So to print at



10x8in, the image needs to be cropped by 0.667in. Resolution at this size is 225 pixels/inch, which is adequate – a lower figure would mean a smaller print, or having to accept poor quality. Leave Resolution at 300 pixels/inch and click OK.

5 Once you've checked that your photo has enough pixels for the size you want, it's time to crop it to the right shape. The most basic method is to draw around (or 'marquee') an area with the rectangular selection tool. In Photoshop Elements, press M to activate this. In the Options bar at the top, set Feather to 0. Change the Mode to Fixed Aspect Ratio, then enter the required width and height – for example, '10' and '8' for a 10x8in print. Now when you click and drag, your rectangle will stay this shape. Once you're happy with the selected area, go to Image, Crop on the menu.

6 Alternatively, press C to use the Crop tool. Again, you can enter aspect ratio figures in the Options bar, but you have to give units, so type 10in and 8in for a 10x8in print. You can also enter an output resolution, which automatically resamples the image – but there's no warning if the image gets scaled up, reducing quality, and sharpening is not automatically applied if it's scaled down. Leave the Resolution box blank and draw a rectangle over your image. The area outside is darkened to visualise the cropped result. Adjust the box, which will maintain the correct aspect ratio, by dragging its handles before double-clicking to apply the crop.

7 Go back to Image Size to assess the result. The Crop tool adjusts the nominal resolution so that the Document Size matches what you entered. If you used a marquee crop, re-enter your desired width or height now. This cropped image works out at 377 pixels/inch, which is more than the necessary 300, but not so much more that we would need to resize. Save the cropped image, using a new filename to preserve the original photo. It is now ready to print.

Print resolutions What image sizes will work?

You need an image to be about 300 pixels per inch for printing. More than this will give no visible benefit. As little as 200 will give a reasonable print, but anything below this will be of noticeably poor quality. Here's a rough guide to the print sizes suitable for various digital camera resolutions. A4 paper falls between 10x8in and 12x10in. You could get

away with 10-12 megapixels for an A3 print. For enormous poster prints, lower resolutions are acceptable because the image will be seen from further away. Remember, when you crop a photo, it's the number of pixels remaining afterwards that determines output resolution. So cameras capable of capturing with many megapixels can be very useful.

PRINT SIZE	IMAGE SIZE	6x4in	7x5in	10x8in	12x10in
SVGA	1,280x960	●	●	●	●
2 megapixels	1,600x1,200	●	●	●	●
3 megapixels	2,048x1,536	●	●	●	●
5 megapixels	2,560x1,920	●	●	●	●
8 megapixels	3,264x2,448	●	●	●	●

● Good ● Acceptable ● Poor

8 If the image works out at less than 200 pixels/inch, you've cropped too much, so cancel and undo (by pressing Ctrl-Z) and try again. But what if you have too many pixels? Our cropped image has nearly 600 pixels/inch at the desired size. To reduce it, tick Resample Image, then tick Constrain Proportions to avoid squashing or stretching. Set the resampling method to Bicubic Sharper. Set Resolution to 300 pixels/inch and then click OK.

9 Greater reductions demand extra sharpening. The following technique can also be used if your software lacks a Sharper resampling option. First, see how much reduction is required to get your image down to size. Here, we want to output a 12-megapixel photo as a 3x2.25in mini print. At the required size (with Resample Image unticked), the resolution is more than 1,200 pixels/inch. Tick Resample Image and change the units for Pixel Dimensions to percent, then type 300 into the Resolution box. The percentages update to show how much the image needs reducing. In this case, it would end up at 25 per cent of its current size.

10 Don't apply this change. Instead, untick Resample Image, leave Resolution at 300 and click OK. Then use the Unsharp Mask filter, on the Enhance menu in Photoshop Elements 5 and later. Set Amount to 100%, and Threshold to 4. The Radius setting is adjusted according to how much you're planning to reduce the image. Try 1.5 pixels if you're halving its size (reducing to 50 per cent), three pixels if quartering its size (25 per cent, as in our example) and so on. When you're done, Click OK.

11 Go back to Image Size. Tick Resample Image and, in the Pixel Dimensions area, set Width to 70 percent. Click OK. Go back to Unsharp Mask, halve the Radius and click OK.

12 Repeat this sequence of sharpening and sampling down, until setting Width to 70 percent brings the Document Size close to your required size, with the resolution at 300pixels/inch. At this point, you can enter the exact width under Document Size and click OK. It may seem like a hassle, but the sharpness of the print will be much improved. **ES**

